

**WHAT IS CLAIMED IS:**

1. A method for multiplexing Data Over Cable Service Interface Specifications (DOCSIS) data into an Moving Pictures Experts Group (MPEG) Transport Stream comprising:

synchronizing an MPEG system clock and a DOCSIS system clock;

multiplexing a DOCSIS data stream into an MPEG Transport Stream while preserving the accuracy of a number of MPEG program clock reference (PCR) values;

transmitting said multiplexed Transport Stream including said PCR values;

receiving said multiplexed Transport Stream in a receiving device;

recovering said MPEG PCR values; and

generating a DOCSIS clock based on said MPEG PCR values.

2. The method of claim 1, wherein said multiplexing a DOCSIS data stream into an MPEG Transport Stream comprises overwriting a number of null packets of said MPEG Transport Stream with a number of packets containing DOCSIS data.

3. The method of claim 1, wherein said generating said DOCSIS clock based on said MPEG PCR values comprises:

receiving said MPEG PCR values in said receiving device;

recovering said MPEG system clock; and

scaling said MPEG system clock using a phase-locked loop to generate said DOCSIS system clock.

4. The method of claim 3, wherein said step of recovering said MPEG system clock comprises locking a local 27 MHz clock based on said received MPEG PCR values.

5. The method of claim 1, further comprising:

identifying a number of packets of said MPEG Transport Stream; and

applying either said MPEG clock value or said generated DOCSIS clock value to said number of packets based on said identification.

6. The method of claim 5, wherein said packets are identified by a packet identifier located in said packet.

7. The method of claim 6, wherein said packets are identified as either a DOCSIS packet or a non-DOCSIS packet.

8. A system for multiplexing Data Over Cable Service Interface Specifications (DOCSIS) data into an Moving Pictures Experts Group (MPEG) Transport Stream comprising:

a signal transmitter including a multiplexer; and

a signal receiver communicatively coupled to said signal transmitter;

wherein said signal transmitter is configured to synchronize an MPEG system clock and a DOCSIS clock, multiplex said DOCSIS data into said MPEG Transport Stream, and transmit said MPEG Transport Stream to said signal receiver including a number of MPEG program clock reference (PCR) values corresponding to said DOCSIS data;

wherein said receiver is configured to generate a DOCSIS clock value for said DOCSIS data based upon said MPEG PCR values.

9. The system of claim 8, wherein said multiplexed Transport Stream is configured to be received by one tuner and one demodulator.

10. The system of claim 8, wherein said signal receiver is configured to:  
receive said MPEG PCR values;  
recover said MPEG system clock from said MPEG PCR values; and  
scale said MPEG system clock to generate a DOCSIS system clock.

11. The system of claim 10, wherein said MPEG system clock is recovered by locking a local clock disposed in said signal receiver based on said received MPEG PCR values.

12. The system of claim 8, wherein said signal receiver forms a part of a set-top box.

13. The system of claim 8, wherein said signal transmitter forms a part of a headend unit.

14. A system for multiplexing Data Over Cable Service Interface Specifications (DOCSIS) data into an Moving Pictures Experts Group (MPEG) Transport Stream comprising:

means for transmitting a signal;  
means for multiplexing communicatively coupled to said means for transmitting; and  
means for receiving a signal communicatively coupled to said means for transmitting;  
wherein said means for transmitting is configured to synchronize an MPEG system clock and a DOCSIS system clock, multiplex said DOCSIS data into said MPEG Transport Stream, and transmit said MPEG Transport Stream to said means for receiving a signal including a number of MPEG program clock reference (PCR) values corresponding to said DOCSIS data;

wherein said means for receiving a signal is configured to generate a DOCSIS clock value for said DOCSIS data based upon said MPEG PCR values.

15. The system of claim 14, wherein multiplexed Transport Stream is configured to be received by one tuner and one demodulator.

16. The system of claim 14, wherein said means for receiving a signal is configured to:

receive said MPEG PCR values;  
recover said MPEG system clock; and  
scale said MPEG system clock using a phase-locked loop to generate said DOCSIS system clock.

17. A data transmitter configured to multiplex Data Over Cable Service Interface Specifications (DOCSIS) data into a Moving Pictures Experts Group (MPEG) Transport Stream comprising:

a transmitter; and

a multiplexer communicatively coupled to said transmitter;

wherein said multiplexer is configured to synchronize an MPEG system clock and a DOCSIS system clock and multiplex said DOCSIS data into said MPEG Transport Stream such that a DOCSIS clock associated with said DOCSIS data may be generated from a number of MPEG program clock reference (PCR) values.

18. The data transmitter of claim 17, wherein said multiplexer is configured to multiplex said DOCSIS data into said MPEG Transport Stream by overwriting a number of null packets of said MPEG Transport Stream with a number of packets containing said DOCSIS data.

19. The data transmitter of claim 17, wherein said transmitter is further configured to transmit said multiplexed MPEG Transport Stream including said MPEG PCR values to a receiving device.

20. A data receiver comprising:

a tuner; a

a demodulator; and

a processor;

wherein said data receiver is configured to receive a multiplexed Moving Pictures Experts Group (MPEG) Transport Stream including Data Over Cable Service Interface Specifications (DOCSIS) data and a plurality of MPEG program clock reference (PCR) values;

wherein said receiver is configured to generate a DOCSIS clock value for said DOCSIS data based upon said MPEG PCR values.

21. The data receiver of claim 20, wherein said receiver is configured to:  
receive said MPEG PCR values;  
lock a local clock disposed in said receiver based on said received MPEG PCR values;  
compute a difference between said received PCR values and said local clock; and  
adjust the frequency of said local clock based on said computed difference.

22. A method for multiplexing Data Over Cable Service Interface Specifications (DOCSIS) data into an Moving Pictures Experts Group (MPEG) Transport Stream comprising:

synchronizing an MPEG system clock and a DOCSIS system clock;  
multiplexing a DOCSIS data stream into an MPEG Transport Stream while preserving the accuracy of a number of DOCSIS SYNC timestamp values;  
transmitting said multiplexed Transport Stream including said DOCSIS SYNC timestamp values;  
receiving said multiplexed Transport Stream in a receiving device;  
recovering said DOCSIS SYNC timestamp values; and  
generating an MPEG system clock based on said DOCSIS SYNC timestamp values.

23. The method of claim 22, wherein said generating said MPEG system clock based on said DOCSIS SYNC timestamp values comprises:

receiving said DOCSIS SYNC timestamp values in said receiving device;  
recovering said DOCSIS system clock; and  
scaling said DOCSIS system clock using a phase-locked loop to generate said MPEG system clock.

24. The method of claim 23, wherein said step of recovering said DOCSIS system clock comprises locking a local 10.24 MHz clock based on said received DOCSIS SYNC timestamp values.

25. The method of claim 22, further comprising:  
identifying a number of packets of said MPEG Transport Stream; and

applying either said MPEG clock value or said generated DOCSIS clock value to said number of packets based on said identification.

26. A method for multiplexing Data Over Cable Service Interface Specifications (DOCSIS) data into an Moving Pictures Experts Group (MPEG) Transport Stream comprising:

synchronizing an MPEG system clock and a DOCSIS system clock to a third clock;  
multiplexing a DOCSIS data stream into an MPEG Transport Stream;  
transmitting said multiplexed Transport Stream including a number of time stamp values from said third clock;  
receiving said multiplexed Transport Stream in a receiving device;  
recovering said time stamp values from said third clock; and  
generating both an MPEG system clock and a DOCSIS system clock based on said time stamp values from said third clock.

27. The method of claim 26, wherein said generating said MPEG system clock and said DOCSIS system clock based on said time stamp values from said third clock comprises:

receiving said time stamp values from said third clock in said receiving device;  
recovering said third clock;  
scaling said third clock using a first phase-locked loop to generate said MPEG system clock; and  
scaling said third clock using a second phase-locked loop to generate said DOCSIS system clock.

28. The method of claim 27, wherein said step of recovering said third clock comprises locking a local clock having the same operating frequency as said third clock, wherein said locking is based on said received time stamp values.

29. The method of claim 26, further comprising:  
identifying a number of packets of said MPEG Transport Stream; and  
applying either said MPEG clock value or said generated DOCSIS clock value to said  
number of packets based on said identification.